TILAK MAHARASHTRA VIDYAPEETH,PUNE

TEACHING AND EXAMINATION SCHEME FOR DIPLOMA COURSE

COURSE NAME : DIPLOMA IN ELECTRONICS AND TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

DURATION OF COURSE : 6 SEMESTERS

SEMESTER : FIFTH **DURATION: 16 WEEKS**

FULL TIME

SR. NO.	SUBJECT TITLE	SUBJECT CODE	TEACHING SCHEME		EXAMINATION SCHEME											
			TH	PR	PAPER HRS	TH		INT	TOTAL		PR		OR		TW	
						Max	Min		Max	Min	Max	Min	Max	Min	Max	Min
1	Maintenance of Computer & Electronic Equipments	ET5001	03	04	03	80	32	20	100	40	--	--	25**	10	25*	10
2	Microcontrollers and Microprocessors	ET5002	04	02	03	80	32	20	100	40	50**	20	--	--	--	--
3	Digital Communication	ET5003	04	02	03	80	32	20	100	40	--	--	25**	10	--	--
4	Power Electronics	ET5004	03	02	03	80	32	20	100	40	--	--	--	--	25*	10
5	Audio Video Engineering	ET5005	03	02	03	80	32	20	100	40	--	--	25**	10	--	--
6	Professional Practices – IV	ET5006	--	02***	--	--	--	--	--	--	--	--	--	--	50*	20
7	Principles of Management	ET5007	04	--	03	80	32	20	100	40	--	--	--	--	--	--
8	Development of generic Skills-II	ET5011	01	--	02	40	16	10	50	20	--	--	-	--	--	--
TOTAL			**22**	**14**	**--**	**520**	**--**	**130**	**650**	**--**	**50**	**--**	**75**	**--**	**100**	**--**

STUDENT CONTACT HOURS PER WEEK (FORMAL TEACHING): **36 HRS: Theory and practical Periods of 60 minutes each.**

* - INTERNAL ASSESSMENT , ** - EXTERNAL ASSESSMENT, ***-TUTORIAL **TOTAL MARKS – 875**

ABBREVIATIONS: TH – THEORY, PR – PRACTICALS, OR –ORAL, TW – TERMWORK, INT—INTERNAL

All Practical, Orals & Term work assessments are to be done as per the prevailing curriculum implementation & assessment norms.

COURSE NAME : DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : MAINTENANCE OF COMPUTER & ELECTRONIC EQUIPMENTS

SUBJECT CODE : ET5001

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme						
TH	**PR**	**PAPER HRS**	**TH**	**INT**	**PR**	**OR**	**TW**	**TOTAL**
03	04	03	80	20	--	25**	25*	150

Pre-requisites: The student must know the following concepts:

1. Basic knowledge of computer
2. Basic knowledge of computer hardware

Objectives: The student will be able to

1. Debug and repair the fault in system
2. Assemble the system
3. Load the operating system And device drivers in the system

Title: MAINTENANCE OF COMPUTER & ELECTRONIC EQUIPMENTS Sub Code:ET5001

Contents: Theory

Unit	Name of the Topic	Hours	Marks
01	**MOTHER BOARD AND ITS COMPONENTS** Different types of PC configurations and their comparison. Chipset basic, Chipset Architecture: North/South Bridge architecture and Hub architecture. Architecture of Intel chipset 915 G& 945 G. Overview and features of ISA, PCI-X, PCI-Xpress, AGP, Processor Bus (no pin description). Comparison between PCI and PCI Express. Logical memory organization: Conventional memory, Extended memory, Expanded memory (No memory map). Concept of cache memory: Internal cache, External cache (L1, L2, L3 cache). Overview and features of SDRAM, DDR, SDRAM, DDR2, SDRAM, DDR3 BIOS Basics.	**08**	**10**
02	**INPUT AND OUTPUT DEVICES** Construction, working & Installation of Keyboard, Mouse: Mechanical, Opt mechanical, New optical. Scanner: Types, Flat bed, Block diagram and specifications. Modem: Block diagram and specifications. Printer: Dot matrix, Inkjet Laser: Block diagram and specifications.	**06**	**10**
03	**POWER SUPPLIES** Block diagram and working of SMPS. Signal description and pin diagram of AT and ATX connectors. Power supply characteristics: Rated wattage, Efficiency, Regulation, Ripple, Load regulation, line regulation. Power problems: Blackout, Brownout, surges and spikes. Symptoms of power problems. Protection devices, Surge suppressor: working. UPS: Block diagram, working, Types, Rating.	**04**	**10**
04	**PC DIAGNOSTIC, TESTING AND MAINTENANCE AND TOOLS** Preventive Maintenance: Active Preventive maintenance, passive preventive maintenance, periodic maintenance procedure. Preventive maintenance of peripherals of PCs. Fault finding and troubleshooting of the above peripherals. ESD (Electrostatic discharge), RFI protection. Working of logic probe, logic purser, current tracer.	**08**	**10**
05	**RELIABILITY ASPECTS OF ELECTRONIC EQUIPMENT** Traditional bathtub reliability curve, Generalized reliability curve ,Mean time to fail ,Failure rate ,Mean time between failure, Mean time to repair ,Mean time to restore system, Thermal acceleration, Electrical acceleration, Damp heat acceleration, Practical reliability, Quality standards, Maintenance policy, Preventive maintenance, Corrective maintenance, Qualitative Maintenance.	**04**	**10**
06	**MAINTENANCE MANAGEMENT** Maintenance policy, Equipment service options, Types of contract, General contract provision, Maintenance organization , Training Maintenance Personal, Planning of spare parts inventory, Assessing spare parts requirement , Essentials of a good equipment management programme, Planning for new equipment, Acquisition process , Planning of utilities, Incoming inspection, Inventory control ,User training ,Technical training, Management of service manual and reference library, Maintenance Arrangement ,Calibration Check , Preventive Maintenance, ALERT Issue, Quality Assurance, Installation	**08**	**10**

	procedure.		
07	**FUNDAMENTAL TROUBLESHOOTING PROCEDURE** Reading of block diagram, Reading of circuit diagram, Reading of working diagram, Di-assembly , Re-assembly ,Trouble shooting process, Fault establishment ,Fault correction , Fault finding aids, Service, Maintenance & Instruction manuals ,Test and measuring Tools, Pre Trouble shooting technique, Preliminary observation ,Functional area approach, Split half method ,Divergent path , Convergent path, Feedback path ,Systematic troubleshooting checks, Check control setting, Checks associated equipments, Visual check: Calibration, Isolates the troubling circuit, Measurement, Individual components, Visual inspection. Fault finding flow check ,Diagnostic software	**10**	**20**
	TOTAL	**48**	**80**

Practical:

Skills to be developed

Intellectual skills:

1. Methods of fault finding.
2. Methods of fault correction.

Motor skills:

1. Follow proper procedure for troubleshooting.
2. Follow proper procedure for assembling the computer parts.

List of Practical:

1. Study of components of Pentium IV motherboard
2. Study of HDD, its installation and partitioning
3. Study of Display adapter
4. Study of Keyboard
5. Study of Mouse and its types
6. Study of preventive maintenance of peripherals of PC.
7. Testing of resister, capacitor and inductance by using multimeter and LCR meter, CRO & Transistor using Transistor Tester. Testing of diodes: zener diode, varactor diode, VDR, Photo diode, Tunnel diode, LDR, Thermister, Testing of 7 segment display, FET, MOSFET, SCR, Triac with help of multimeter.
8. LAYOUT of components for given function generator:
   Tracing of alternation section used in function generator.
   Voltage analysis in given function generator.

9. Layout of components for given CRO:
   Tracing a vertical section used in CRO.
   Voltage analysis in CRO.
   Signal Tracing in CRO.
   Fault finding in CRO by voltage analysis method.
   Fault finding in CRO by signal tracing method.
10. Prepare fault finding flow chart using computer
    (at least for two faults in each equipments)

1. Power supply
2. Function generator
3. CRO

11. Collect the catalog from market/ Internet and write down the information about specification manufacture, cost for the following (at least five from each group)

(A)

Resister	LCD Display
Capacitor	LED Display
Inductors	Microprocessor
Transformer	Micro controller
Diode	Switches
Darlington Transistor	Fuses
FET	IC Sockets
MOSFET	Solder materials
IGBT	Soldering station
Photo devices	Desolder (winding pump)
TTL IC	Heat sinks
CMOS IC	
Thyristors	

(B)

Pliers
Cutters
Spanners (Wrenches)
Screw drivers
Jewelers screw drivers
Hack jaw
Hand drill & drills
Files

Hand held power tools & whole complement of drilling, grinding, polishing, soldering and cutting

Attachment

(C)

Brushes

Blades

Sponge

Inspection mirror

Magnifying glass

Thread

Sleeves

(D)

Contact cleaners

Control cleaners

Lubricants (WD40, LPSI)

Flux remover

Tuner cleaner

Adhesives

Solvent release

Silicon rubber

Recommended Books:

Sr. No.	Title	Author	Publisher
01	Managing & Troubleshooting PCs	Mike Meyers, Scott Jernigan	Tata McGraw Hill
02	Bigelow's Troubleshooting,	Bigelow	Tata McGraw Hill
03	Maintaining & Repairing PCs	Mark Minasi	BPB Publication
04	The Complete PC Upgrade & Maintenance Guide	D Balasubramaniam	Tata McGraw Hill
05	Computer Installation & Servicing Upgrading & Repairing PCs	Scott Mueller	Pearson Education
06	Trouble Shooting Electronic Equipment	R.S. Khandpar	Tata McGraw Hill
07	Electronic Testing & Fault Diagnosis	G.C. Loveday	Longman scientific and technical

COURSE NAME : DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : MICROCONTROLLERS & MICROPROCESSORS

SUBJECT CODE : ET5002

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme						
TH	**PR**	**PAPER HRS**	**TH**	**INT**	**PR**	**OR**	**TW**	**TOTAL**
04	02	03	80	20	50**	--	--	150

Pre-requisites: The **s**tudent must know the following concepts:

1. Architecture of 8085 microprocessor
2. Pin diagram of 8085 microprocessor
3. 8085 instruction set
4. Basic concept of I/O devices

Objectives: The student will be able to

1. Use data transfer techniques for serial & parallel communication
2. Describe the interfacing of I/O devices with 8085
3. Describe the RISC & CISC Architecture
4. Compare between Microprocessors & Microcontrollers
5. Describe architecture and pin diagram of 8051 microcontroller.
6. Develop assembly language program using instruction set of 8051

Subject Title: MICROCONTROLLERS & MICROPROCESSORS	Subject Code: ET5002

Contents: Theory

Unit	Name of the Topic	Hours	Marks
01	**PERIPHERAL DEVICES** Need of peripheral, Data Transfer Techniques: Synchronous and Asynchronous, Serial and Parallel, Hand shaking, Polling, Interrupt driven Microprocessor controlled with DMA (Only concept of DMA; no chip details).	02	04
02	**PROGRAMMABLE I/O DEVICES** IC 8155: Block Diagram, pin out, Operating modes, Simple I/O programs and Interfacing with 8085 Microprocessor. Comparison of features of 8155, 8355 and 8755. Minimum system configuration of 8085 Microprocessor. IC 8255: Block Diagram, Pin Out, Operating modes, Simple I/O programs and Interfacing with 8085 Microprocessor. Interfacing of A to D Converter with 8085 Microprocessor. Interfacing of D to A Converter with 8085 Microprocessor. 8085 Microprocessor Applications: Stepper Motor Control, Temperature Control.	12	18
03	**INTRODUCTION TO MICROCONTROLLER** Comparison of Microprocessor, Microcontroller and Microcomputer. Evaluation of Microcontroller. Terminology: - RISC, CISC, VLIW, Harvard and Von-Neumann Architecture, Memory types: ROM and RAM. Commercial Microcontroller devices and families.	02	06
04	**8051 MICROCONTROLLER** MCS-51 Architecture and details, Pin configuration, 8051 Hardware details- Clock, Oscillator, Registers, SFRs, DPTR, Flags, Stack, PC, Ports, Internal RAM and ROM as Data Memory and Program Memory. Interfacing of External Memory.	14	18
05	**ADDRESSING MODES AND INSTRUCTIONS OF 8051** 8051 Addressing modes, MCS-51 Instruction Set, Simple Programming.	08	06
06	**ASSEMBLY LANGUAGE PROGRAMMING OF 8051** Development systems tools: Editor, Assembler, Linker. Creating various files to run the 8051 program (asm, obj, lst and hex files). 8051 Data Types and Directives (DB, ORG, EQU, END etc), Software Simulators of 8051 SPJ Systems, Keil Compiler.	02	08
07	**TIMERS/COUNTERS, INTERRUPTS AND SERIAL COMMUNICATION** Timer modes and programming of 8051 timers. Study of SFRs of Timer: TMOD and TCON in detail. Interrupts of 8051 and their priority. Study of IE and IP SFRs. Study of SBUF, SCON and PCON SFRs.	08	20
	TOTAL	48	80

Practical:

Skills to be developed

Intellectual skills:

1. Ability to write algorithm and assembly language program.
2. Ability to design hardware interfacing.

Motor skills:

1. Ability to work on development tools.
2. To load the program into memory of Microcontroller.
3. To observe the result in specific memory location and registers.

List of Practical: (Any 9 to be performed)

1. 8155 Interfacing :(I/O Mode, Generation of square and sine wave using Timer mode)
2. 8255 Interfacing: (I/O Mode and BSR Mode Operations)
3. Generation of square, triangular and sine wave using DAC
4. Any one application of A to D converter Interfacing.
5. Stepper Motor Control
6. Addition, Subtraction, Multiplication and Division operations
7. Packing and unpacking of 8 bit data
8. Assembly Code for Seven segment display interfacing.
9. Square wave generation using internal timer of 8051.
10. Assembly code for transferring Message serially.
11. Reading and writing the ports of 8051 microcontroller.
12. Assembly code for handling the interrupts in 8051 microcontroller.

Recommended Books:

Sr. No.	Title	Author	Publisher
01	Microcontrollers: Theory & Applications	Deshmukh	Tata McGraw-Hill
02	Programming & Customizing 8051 Microcontroller	Predko	Tata McGraw-Hill
03	8051 Microcontroller	Mazidi	

COURSE NAME : DIPLOMA IN ELECTRONICS & ELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : DIGITAL COMMUNICATION

SUBJECT CODE : ET5003

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS	TH	INT	PR	OR	TW	TOTAL
04	02	03	80	20	--	25**	--	125

Pre-requisites:- The student must know the following concepts:

1. Basic of communication
2. Basics of analog communication
3. Concepts of modulation
4. Analog modulation techniques
5. Need of multiplexing

Objectives: - The student will be able to

1. Understand Digital communication systems
2. Explain channel capacity theorem and entropy
3. Explain sampling theorem and aliasing effect
4. Describe generation of PAM, PWM and PPM
5. Explain transmission and reception of PCM, DM, ADM, DPCM
6. Explain need of continuous wave modulation
7. Describe shift keying techniques and their applications
8. Explain M-ary techniques
9. Explain multiplexing techniques
10. Describe spread spectrum modulation, its types and applications

Subject Title: DIGITAL COMMUNICATION	Subject Code: ET5003

Contents: Theory

Unit	Name of the Topic	Hours	Marks
01	**INTRODUCTION OF DIGITAL COMMUNICATION** Basic digital communication system, block diagram. Channel capacity-definition, Hartley's law, Shannon-Hartley theorem, Channel capacity equation, channel noise and its effect, entropy. Advantages and disadvantages of digital communication.	04	08
02	**PULSE COMMUNICATION** Introduction, comparison with Continuous Wave Modulation, advantages. Sampling theorem, Nyquist rate, aliasing, natural & flat top sampling. PAM, PWM, PPM definition, generation, block diagram, waveform analysis, and their comparison. Pulse code modulation: block diagram of PCM transmitter & receiver, sampling quantization, quantization error, companding, inter symbol interference. Delta modulation: block diagram of DM, slope overload, granular noise. ADM, DPCM, block diagram and its working.	14	18
03	**DIGITAL MODULATION TECHNIQUES** ASK, FSK, PSK definition & waveforms, their transmitter and receiver block diagram and working. M-ary encoding. QPSK, QAM, DPSK block diagram of transmitter and receiver and working. Bandwidth for each modulation technique and their comparison.	12	18
04	**CODING METHODS AND ERROR CONTROL** Baud rate, Bit rate. Line coding - unipolar, bipolar - NRZ, RZ, Manchester. Source coding, ASCII, EBCDIC and baudot code. Channel coding, Error, Causes of error and its effects, error detection & correction using parity, Hamming code & simple numerical.	06	10
05	**MULTIPLEXING AND MULTIPLE ACCESS** Need of Multiplexing, TDM, and FDM: Definitions block diagram and their comparison. Introduction to WDM Access technique TDMA, FDMA, CDMA (only concepts), advantages of TDMA over FDMA.	06	12
06	**SPREAD SPCTRUM MODULATION(Only Descriptive treatment)** Introduction of PN Sequence. Model of spread spectrum modulation system. Direct sequence spread spectrum signal. Frequency hop spread spectrum, slow frequency hopping, and fast frequency hopping. Applications, SS modulation.	06	14
	TOTAL	48	80

Practical:

Skills to be developed

Intellectual Skills:

1. Selection of appropriate sample.
2. Selection of equipment.
3. Interpretation of waveforms

Motor Skills:

1. Accurate Observation.
2. Setting up of equipment.

List of Practical: (Any 10 to be performed)

1. Observe waveforms of Pulse Amplitude modulation (using natural sampling & flat top sampling).
2. Observe waveforms of Pulse width modulation (using natural sampling & flat top sampling)
3. Observe waveforms of Pulse Position modulation (using natural sampling)
4. Observe waveforms of Pulse code modulation and demodulation.
5. Observe waveforms of Delta modulation.
6. Observe waveforms of Adaptive delta Modulation. Observe waveforms with change in amplitude of modulating Signal & Change in Sampling frequency.
7. Observe waveforms of ASK modulation & demodulation.
8. Observe waveforms of FSK modulation & demodulation.
9. Observe waveforms of PSK modulation & demodulation.
10. Observe waveforms of QPSK modulation & demodulation.
11. Observe waveforms of QAM modulation & demodulation.
12. **Any one of the following:**
    1. Error detection & correction using parity bits.
    2. Error detection & correction using hamming codes
    3. To generate following different line codes and decode them.
        1. NRZ (Unipolar) 2. Bipolar NRZ 3. RZ (Unipolar) 4. Bipolar RZ
13. **Any one of the following:**
    1. Time division multiplexing/ de-multiplexing system.
    2. Frequency division multiplexing/ de-multiplexing system

Recommended Books:

Sr. No.	Title	Author	Publisher
01	Electronic communication system	Wayne Tomasi	Pearson Education
02	Electronics Communication	Louis E. Frenzl	Tata McGraw Hill
03	Communication System	Roddy Collen	Prentice Hall of India
04	Digital Communication	Amitabha	Tata McGraw Hill
05	Digital & Analog Communication	Bhattacharya	John wiley & sons
06	Digital Communication	K. Sam. & Shanmugam	Pearson Education
07	Fundamentals & Applications	B. Sklar	John wiley & sons
08	Digital Communication	Siman Haykin	Technical Publication, Pune
09	Digital Communication	J.S. Chitode	Tata Mc-graw Hill
10	Data Communication Networking	Fourozan	Pearson Education

COURSE NAME : DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : POWER ELECTRONICS

SUBJECT CODE : ET5004

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme						
TH	**PR**	**PAPER HRS**	**TH**	**INT**	**PR**	**OR**	**TW**	**TOTAL**
03	02	03	80	20	--	--	25*	125

Pre-requisites:- The student must know the following concepts:

1. The basic semiconductor theory.
2. Working principle of basic electronic devices and circuit.

Objectives: - The student will be able to

1. Draw & explain the V-I characteristics of various power electronic devices.
2. Describe thyristor turn-on & turn-off mechanism.
3. Explain working of polyphase rectifiers with their waveforms.
4. Explain the working of controlled rectifier.

Subject Title: POWER ELECTRONICS	Subject Code: ET5004

Contents: Theory

Unit	Name of the Topic	Hours	Marks
01	**POWER ELECTRONICS** Introduction to power electronics. Power transistor: Structure of vertical power transistor, I- V characteristics of power transistors, second breakdown, SOA: Safe operating Area.	04	06
02	**THYRISTOR FAMILY DEVICES** Brief introduction to Thyristor family devices: TRIAC, SUS, SCS, SBS, LASCR, PUT, GTO. Construction, Symbol, working and static V/I characteristics of UJT, PUT, SCR, Diac, Triac, IGBT, MOS controlled thyristors, GTO. Two transistor analogy of SCR.	08	20
03	**TURN ON AND TURN OFF METHODS OF THYRISTOR** Introduction to Turn ON and Turn OFF methods of Thyristor. Turn on methods - Forward Voltage triggering, Gate triggering, dv/dt triggering, thermal triggering of Thyristor. Gate trigger circuits - General block diagram of a thyristor gate trigger circuit, Resistance firing circuit, Resistance Capacitance firing circuit, Resistor Capacitor full wave trigger circuit. SCR triggering using UJT, PUT. Synchronized UJT triggering. Thyristor Turn OFF methods - Class A, B, C, D, E, F.	10	20
04	**POLYPHASE RECTIFIERS** Need and Use of Polyphase Rectifiers. Circuit diagram and waveforms of three phase half wave Delta: Wye rectifier. Six phase star half wave rectifier. Three phase Delta - Wye Bridge Rectifier.	06	10
05	**PHASE CONTROLLED RECTIFIERS** Circuit diagram and waveforms of: Single phase half wave controlled rectifier (one - quadrant) with R, RL load. Effect of free wheeling diode. Single phase full wave controlled rectifier (two - quadrant converters), Midpoint converters (M 2 connection) R, RL load. Effect of freewheeling diode. Bridge configurations (B 2 connection). Fully controlled bridge circuit with inductive load (R L load). Rectifying mode, Inverting mode. Single Phase half controlled Bridge rectifier, Half controlled bridge rectifier with Resistive load, Half controlled bridge rectifier with R L load (No mathematical derivations).	12	24
	TOTAL	40	80

Practical:

Skills to be developed

Intellectual Skills:

1. Able to select proper instruments.
2. Compare the characteristics under various conditions.

Motor Skills:

1. Make accurate measurements.
2. Adjust the meters to read zero at start.

A. List of Practical:

1. To plot V/I characteristics of Diac.
2. To plot V/I characteristics of Triac.
3. To plot V/I characteristics of SCR.
4. To find out values of latching and holding current of SCR.
5. To plot V/I characteristics of IGBT.
6. To study SCR phase control circuit.
7. To study full wave mid - point circuit with resistive load.

B. Mini project:

1. Synchronized UJT triggering circuit.
2. Develop light dimmer circuit using Diac and Triac

Recommended Books:

Sr. No	Title	Author	Publisher
01	Power Electronics	M D Singh	Tata McGraw-Hill
02	Power Electronics Circuits	K B Khan Chandani	Prentice Hall of India
03	Devices and Applications	Muhammad H.	Khanna Publishers
04	Electronics Industrial and Power	Rashid	Dhanpat Rai and Sons
05	Industrial Electronics	G K Mithal, Dr Manisha Gupta	Umesh Publications

COURSE NAME : DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : AUDIO VIDEO ENGINEERING

SUBJECT CODE : ET5005

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme						
TH	**PR**	**PAPER HRS**	**TH**	**INT**	**PR**	**OR**	**TW**	**TOTAL**
03	02	03	80	20	--	25**	--	125

Pre-requisites: The **s**tudent must know the following concepts:

1. Basics of communication system such as modulation, EM waves etc
2. Working of basic electronics circuits such as amplifiers, sweep generators, power supplies etc.

Objectives: The student will be able to

1. Describe the basic idea about the audio amplifier , public address system, graphic equalizer & Dolby system
2. Explain monophonic and stereophonic stereo system. Compare between the monophonic and stereophonic systems
3. Explain mechanism of CD player controls available on CD player & CD player remote control. Perform fault finding in CD player.
4. Describe monochrome & color television details and fault finding.
5. Explain the concept of cable television and DTH services

Subject Title: AUDIO VIDEO ENGINEERING **Subject Code: ET5005**

Contents: Theory

Unit	Name of the Topic	Hours	Marks
01	**HI-FI AUDIO AMPLIFIER** Introduction to Amplifiers: Mono, Stereo, Public Address System. Difference between stereo amplifier & Mono amplifier. Block diagram of Hi-Fi amplifier & explanation. Controls available on it & its function & other facility available on it like (Mic in, Aux in, earphone in). Graphic equalizer concept, circuit diagram and operation (5 Point Circuit diagram). Dolby NR recording system. Types of speaker - its comparison only I) woofer, II) Mid- range, III) Tweeter. Cross over network circuit & its function	**07**	**08**
02	**CD PLAYER** CD - material used & size. Block diagram of CD player & explanation. Principle & working of detection used in CD player. Component used for CD mechanism. I) CD pick-up assembly, II) gear system, III) drive motors, IV) CD lens. Function of controls. Parts, function of remote control (transmitter unit) & function of receiver used in CD player. Advantages of florescent display system used in CD player.	**07**	**08**
03	**TV FUNDAMENTALS** Concept & explanation of following: Aspect ratio, image continuity, interlace scanning, scanning periods- horizontal & vertical, vertical resolution, horizontal resolution. Vestigial sideband transmission, bandwidth for Colour signal, brightness, contrast, viewing distance luminance, hue, saturation, compatibility. Color theory, primary colors & secondary colors. Grassman's law, additive colour mixing, subtractive colour mixing. Composite Video Signal, explain with waveform: Pedestal height, Blanking pulse, Colour burst, Horizontal sync pulse details, Vertical sync pulse details, Equalizing pulses, CCIR B standards for Colour signal transmission & reception. TV channel allocation for band I & band III.	**09**	**20**
04	**TV TRANSMITTERS AND RECEIVER** Audio and Video signal transmission. Positive and negative modulation. Merits and Demerits of Negative modulation. Introduction to television camera tube (Working & principle only) a) Vidicon b) Plumbicon c) Solid state camera based on CCD Color picture tube (working & principle only) a) PIL b) Delta gun picture tube Blok diagram of monochrome TV transmitter (Function of each block) Block diagram of color TV transmitter. Block diagram of monochrome TV Receiver.	**09**	**12**
05	**COLOR TV AND COMPOSITE VIDEO SIGNAL** Block diagram & operation of colour TV receiver (PAL D type) Explain -Yagi Uda Antenna. Explain block diagram of PAL – D decoder with circuit diagram of chroma signal amplifier, Burst pulse blanking, Colour killer control, Basic Circuit for separation of U & V signals. ACC Amplifier. Colour signal matrixing, RGB drive amplifiers. EHT generation: circuit explanation for line output stage using transistor or IC in Colour TV. Comparisons between NTSC, PAL & SCAM Systems.	**09**	**20**

06	**CABLE TELEVISION** Working Principle and Specification of following components:- Dish antenna, LNBC, Multiplexer, Attenuators, Connectors (two ways & three ways), Amplifier & cable. MATV, CATV & CCTV. Design concept for cable TV network. Block diagram of dB meter with working principle. Direct to Home System (DTH): Introduction & Block Diagram	**05**	**12**
	TOTAL	**46**	**80**

Practical:

Skills to be developed

Intellectual Skills:

1. Basic of modulation techniques.
2. Basic of amplifiers and oscillator circuits.

Motor Skills:

1. Testing and fault finding of Television receiver.
2. Measurement of various parameters and CD player and Hi-Fi amplifier.

List of Practical: (Any 10 to be performed)

1. Study and observe the given component layout of a Hi Fi amplifier system.
    a) Trace the output stage of given Hi Fi amplifier system.
    b) Voltage analysis of a given Hi Fi amplifier.
2. Fault Finding (three different faults) in a Hi Fi Audio amplifier:
    a) By Signal injection method.
    b) Confirmation of faulty stage by voltage analysis method.
3. To plot frequency response of graphic equalizer
4. Draw and study drive mechanism layout of CD player.
5. Fault finding in CD player (Three different faults)
6. Tracing of chroma section in given TV receiver.
7. Tracing of picture tube and video amplifier in given TV receiver with multimeter.
8. Tracing of horizontal section in given TV receiver with multimeter.
9. Voltage analysis of picture tube, chroma section and horizontal section.
10. Fault finding in given Colour TV:
    a) No color b) Red Colour only c) Blue color only d) Green color only.
    e) Magenta color only f) Cyan only g) Yellow only h) No raster. No Sound.
11. a) Fault in HSYNC section.

b) Fault in VSYNC section.

12. Fault in SYNC separator.
13. Installation of DTH System.
14. Estimate the cost, layour of Cable TV.
15. Collect information about Set Top box used for Cable TV at home.

Recommended Books:

Sr. .No	Title	Author	Publisher
01	Television & Radio Engineering	A.M Dhake	Tata McGraw-Hill
02	Television Engg and Video System	R.G Gupta	Tata McGraw-Hill
03	Audio Video Systems	R.G Gupta	Tata McGraw-Hill
04	Modern TV Practice	R.R Gulati	New age International
05	Basic Radio and Television	S. Sharma	Tata McGraw-Hill
06	Color Television Principles and Practice	R.R Gulati	New age International
07	Basic Television and Video System	Bernard Grob	Tata McGraw-Hill
08	Mono Chrome and Color Television	R.R Gulati	New age International
09	Modern CD Player Servicing Manual	Manohar Lotia	BPB Publication

COURSE NAME : DIPLOMA IN ELECTRONIC & TELE COMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : PROFESSIONAL PRACTICES-IV

SUBJECT CODE : ET5006

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme						
TH	**TUT**	**PAPER HRS**	**TH**	**INT**	**PR**	**OR**	**TW**	**TOTAL**
--	02***	--	--	--	--	--	50*	50

Prerequisites: The student must know the following concepts:

1. Communication skills.
2. Basic technological concepts.

Objectives: The student will be able to

1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Prepare a report on industrial visit, expert lecture

Subject Title: PROFESSIONAL PRACTICES-IV **Subject Code: ET5006**

Sr.No.	Activity	Hours
01	**INDUSTRIAL VISITS (2 VISITS)** Structured industrial visits shall be arranged and report of the same should be submitted by the individual student, to form a part of the term work. Following are the suggested type of Industries/ Fields -(Any three visits) i. Data Acquisition System ii. Sugar Mill, Paper Mill, Cement Industry iii. Satellite Earth Station iv. Railway Station Control Room v. Digital RPM Meter Manufacturing Unit vi. Industry where Digital Drives are used vii. Digital Counters	**10**
02	**GUEST LECTURES** The guest lectures from field/industry experts, professionals to be arranged (2 hrs), minimum 3 nos. from the following or alike topics. students should submit a brief report on the guest lecture as part of term work i. Emerging Technology ii. Peripheral Devices iii. Blue Tooth Technology iv. Energy Crisis and Alternative Energy Sources v. Digital Invertors vi. Total Quality Management vii. Six Sigma	**06**
03	**INFORMATION SEARCH** Data collection and writing a report on the topic (any 2 topics) a. CDMA b. GPS c. Manufacturing process of ICs d. WLL Technology	**08**
04	**GROUP DISCUSSION**: The students should discuss in group of six to eight students and write a brief report on the same as a part of term work. The topic of group discussions may be selected by the faculty members.	**04**
05	**SEMINAR : (Any 2 Topics)** Seminar topic should be related to the subjects of fifth semester Each student shall submit a report of 5 to10 pages and deliver a seminar (Presentation time - 10 minutes)	**08**
	TOTAL	**36**

COURSE NAME : DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : PRINCIPLES OF MANAGEMENT

SUBJECT CODE : ET5007

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme						
TH	**PR**	**PAPER HRS**	**TH**	**INT**	**PR**	**OR**	**TW**	**TOTAL**
04	--	03	80	20	--	--	--	100

Pre-requisites:- The student must know the following concepts:

1. Industrial working and different requirements of production.
2. Different activities in organization

Objectives: - The student will be able to

1. Explain the importance of management process in Business.
2. Identify various components of management.
3. Describe Role & Responsibilities of a Technician in an Organizational Structure.
4. Apply various rules and regulations concerned with Business & Social Responsibilities of the technician.

Subject Title: PRINCIPLES OF MANAGEMENT	Subject Code: ET5007

Contents: Theory

Unit	Name of the Topic	Hours	Marks
01	**ORGANIZATIONAL MANAGEMENT** Organization: Definition, Steps in Organization. Types of Organization: - Line, Line & Staff, Functional. Project Departmentation – Centralized & Decentralized, Authority & Responsibility, Span of Control. Forms of Ownership: Proprietorship, Partnership, Joint Stock, Co-operative Society, Govt. Sector	**06**	**08**
02	**MANAGEMENT PROCESS** Definition of Management, Evolution, various definitions, concept of management, levels of management. Administration and management, scientific management by F.W. Taylor Principles of management (14 principles of Henry Fayol). Functions of management: Planning, Organizing, Directing, Controlling	**06**	**08**
03	**PRODUCTION MANAGEMENT** Product Selection, production analysis, simplification, standardization, diversification, production planning and control, principles and objectives, production planning, routing, loading Scheduling, Scheduling techniques, CPM, PERT concepts. Significance of standards (Indian and international), ISO Concept.	**06**	**08**
04	**HUMAN RESOURCE MANAGEMENT** Personnel Management • Introduction • Definition • Functions Staffing • Introduction to HR Planning • Recruitment Procedure Personnel- Training & Development • Types of training Induction Skill Enhancement Leadership & Motivation • Maslow's Theory of Motivation Safety Management • Causes of accident • Safety precautions Introduction to – • Factory Act • ESI Act • Workmen Compensation Act • Industrial Dispute Act	**06**	**10**
05	**FINANCIAL MANAGEMENT** Financial Management- Objectives & Functions. Capital Generation & Management • Types of Capitals • Sources of raising Capital Budgets and accounts • Types of Budgets • Production Budget (including Variance Report) • Labour Budget • Introduction to Profit & Loss Account (only concepts) ;	**08**	**16**

	Balance Sheet Introduction to – • Excise Tax • Service Tax • Income Tax • VAT • Custom Duty		
06	**MATERIALS MANAGEMENT** Inventory Management (No Numericals) • Meaning & Objectives ABC Analysis Economic Order Quantity • Introduction & Graphical Representation Purchase Procedure • Objects of Purchasing • Functions of Purchase Dept. • Steps in Purchasing Modern Techniques of Material Management • Introductory treatment to JIT / SAP / ERP	**08**	**16**
07	**PROJECT MANAGEMENT** Project Management (No Numerical) • Introduction & Meaning • Introduction to CPM & PERT Technique • Concept of Break Even Analysis Quality Management • Definition of Quality , concept of Quality , Quality Circle, Quality Assurance • Introduction to TQM, Kaizen, 5 'S', & 6 Sigma	**08**	**14**
	TOTAL	**48**	**80**

Recommended Books:

Sr. No	Title	Author	Publisher
01	Industrial Engg & Management	Dr. O.P. Khanna	Dhanpal Rai & sons New Delhi
02	Business Administration & Management	Dr. S.C. Saksena W.H. Newman	Sahitya Bhavan Agra
03	The process of Management	E.Kirby Warren Andrew R. McGill	Prentice- Hall
04	Industrial Management	Rustom S. Davar	Khanna Publication
05	Industrial Organisation & Management	Banga & Sharma	Khanna Publication
06	Industrial Management	Jhamb & Bokil	Everest Publication , Pune

COURSE NAME : DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET/ME/CO

SEMESTER : FIFTH

SUBJECT TITLE : DEVELOPMENT OF GENERIC SKILLS-II

SUBJECT CODE : ET5011

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme		Examination Scheme						
TH	**TUT**	**PAPER HRS**	**TH**	**INT**	**PR**	**OR**	**TW**	**TOTAL**
01	--	02	40	10	--	--	--	50

Pre-requisite: The student must know the following concepts:

1. Development of generic skills-I

Objectives: The **s**tudent will be able to

1. Acquire information from different sources and present it in their own words- own language
2. Prepare yourself for presenting certain topic in such a way that you may impress the audience.
   One should take care of:
   a) Body language
   b) Eye contact
   c) Voice pitch
   d) Facial expressions
   e) Overall impact on the audience

Subject Title: DEVELOPMENT OF GENERIC SKILLS-II Subject Code: ET5011

Contents: Theory:

Unit	CONTENTS	Hours	Mark
01	**SOCIAL SKILLS** Society, social structure, develops sympathy and empathy.	**01**	**03**
02	**SWOT ANALYSIS** Concept, How to make use of SWOT Analysis.	**01**	**03**
03	**INTER PERSONNEL RELATION** Sources of conflict, Resolution of conflict. Ways to enhance interpersonal relations	**02**	**05**
04	**PROBLEM SOLVING** • Steps in problem solving, • Identify and clarify the problems • Information gathering related to problem, • Evaluate the evidence, • Consider alternative solutions and their implications • Choose and implement the best alternative • Review Problem solving technique(any one technique may be considered): 1. Trial and error 2. Brain storming 3. Lateral thinking	**02**	**05**
05	**PRESENTATION SKILLS** • Body language • Dress like the audience • Posture, Gestures, Eye contact and facial expressions. • Presentation Skill • Stage fright • Voice and language - Volume, Pitch, Inflection, Speed, Pause • Pronunciation, Articulation, Language, • Practice of speech. Use of aids -OHP,LCD projector, white board	**04**	**11**
06	**GROUP DISCUSSION AND INTERVIEW TECHNIQUE** • Introduction to group discussion • Ways to carry out group discussion, Parameters— Contact, body language, analytical and logical thinking, decision making • Interview technique: Necessity, Tips for handling common questions.	**02**	**05**
07	**WORKING IN TEAMS** • Understand and work within the dynamics of a groups.	**02**	**05**

	• Tips to work effectively in teams. • Establish good rapport, interest with others and work effectively with them to meet common objectives. • Tips to provide and accept feedback in a constructive and • Considerate way • Leadership in teams, handling frustrations in group.		
08	**TASK MANAGEMENT** • Introduction • Task identification • Task planning, organizing and execution. • Closing the task	**02**	**03**
	TOTAL	**16**	**40**

Mini Project: On Task Management. Decide any to be competed in a stipulated time with the help of teacher. Write a report considering various steps in task management.

Recommended Books:

Sr. No.	Title of the book	Author	Publisher
01	Adams Time management	Marshall Cooks	Viva Books
02	Basic Managerial Skills for All	E.H. Mc Grath , S.J.	Pretice Hall of India, Pvt Ltd
03	Body Language	Allen Pease	Sudha Publications Pvt. Ltd.
04	Creativity and problem solving	Lowe and Phil	Kogan Page (I) P Ltd
05	Decision making & Problem Solving	Adair, J	Orient Longman
06	Develop Your Assertiveness	Bishop , Sue	Kogan page India
07	Assertiveness	Marion E Haynes	Orient Longman
8	Make Every Minute Count	Steven L McShane and Mary	Kogan Page India
9	Organizational Behavior	Stephen P. Robbins	Tata McGraw Hill

10	Presentation Skills	Michael Hatton	Pretice Hall of India, Pvt Ltd
11	Stress Management Through Yoga and Meditation	Pandit Shambhu Nath	Sterling Publisher Pvt Ltd
12	Target setting and Goal Achievement	Richard Hale ,Peter Whilom	Kogan page India
13	Time management	Chakravarty, Ajanta	Rupa and Company
14	Working in Teams	Harding ham .A	Orient Longman